ncover 新發明產品說明

About ncover—The Revolutionary Invention

壹、 現行上帶優缺點 The advantages and disadvantages of the current cover tape

一、熱封型（Heat Activated Adhesive，HAA）上帶：

加熱式包裝上帶的優點在於使用時可隨加工條件的變更而獲得不同的拉力（Peel Strength），但缺點是封合加工條件會因不同廠牌的產品而有所不同。

The advantage of using HAA tape is that the peel strength can be changed accordingly with the different processing conditions. However, the drawback is that the adhesive conditions may vary depending on different brands of products.

- **黏膠層不易受環境改變而影響品質。**

  The glue layer is less susceptible to environmental changes that affect the quality.

- **封合層有彈性，搭配 PS 材質下帶時不會因 PS 老化收縮造成上下帶爆裂開[1]。**

  Because the adhesive layer is flexible, cover and carrier tape will not break open due to the shrinkage of the aged PS.

- **需加熱才有封合效果，使用較不方便，不重複使用，重工亦不便。**

  Adhesive can only be active by heating. It is less user-friendly, non-reusable and also inconvenient for a rework.

[1] 上下帶爆裂原因：上帶封合層質變、下帶收縮、上下帶添加物浮出影響封合介面、假性黏著。Reasons for tapes to burst open: The deterioration of the adhesive layer on the cover tape; the shrinkage on the carrier tape; the adhesive interface is affected by the surface additives from tapes, pseudo-adhesive.

- **封合強度會因加工條件變化，不同材質（PS、PC 或 PET）下帶要搭配不同上帶。**

  Adhesion may vary due to the changes of the processing conditions. A certain kind of cover tape has to match specifically to the carrier tape in different materials (PS, PC or PET).

- **SMT 上有撕裂之虞。**

  Tearing problem on SMT is always a concern.

二、自黏型（Pressure Sensitive Adhesive，PSA）上帶：

自黏式包裝上帶的優點在於封合加工條件不會因不同廠牌的產品而有所不同，但缺點是無法改變拉力值。

On the advantages of PSA tape, taping conditions will not vary because of the use of different brands of products, but the drawback is that the peel strength is unchangeable.

- **無需加熱只需壓力即有封合效果，使用方便，可重複使用，重工亦方便。**

  Adhesive can be active by pressure; heating is not needed. It is reusable, convenient and good for a rework.

- **封合強度不隨加工條件變化，適用各種材質下帶。**

  Adhesion is stable and can be matched with carrier tapes in all materials.

- **黏膠層較易受環境改變而影響品質，容易殘膠。**

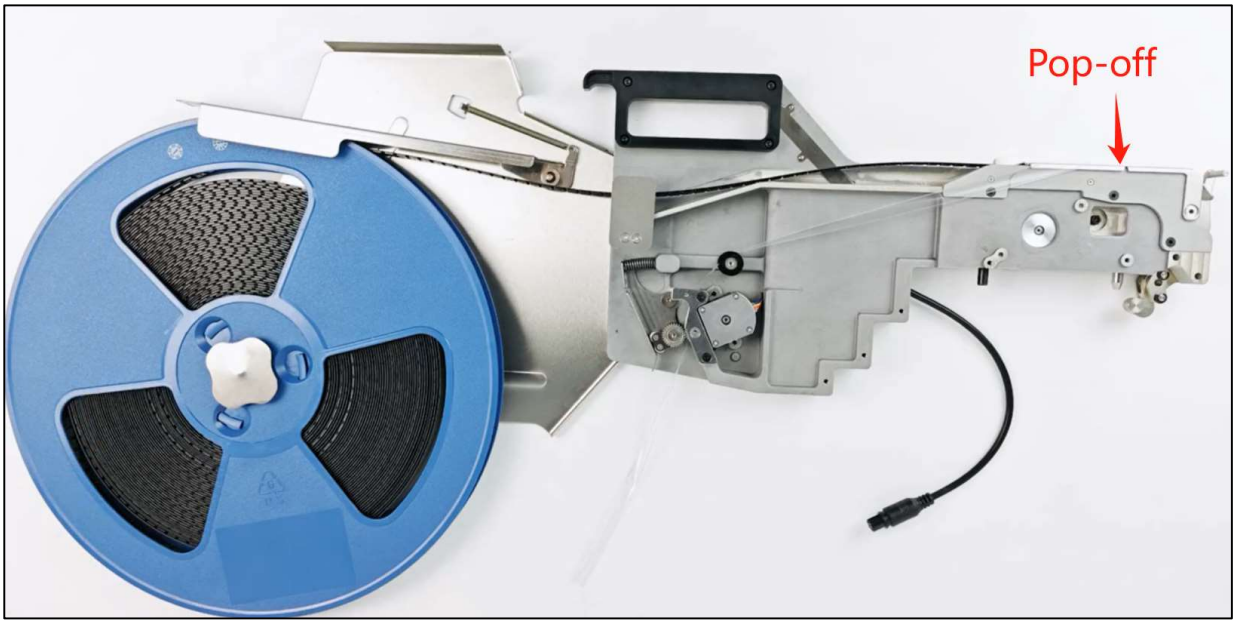
  Adhesive layer is more vulnerable to environmental changes and stays on carrier tape.

- 本身無彈性，用於 PS 材質下帶時會因 PS 老化收縮而上下帶爆裂開，故限用於 PC 材質等老化不收縮的下帶。

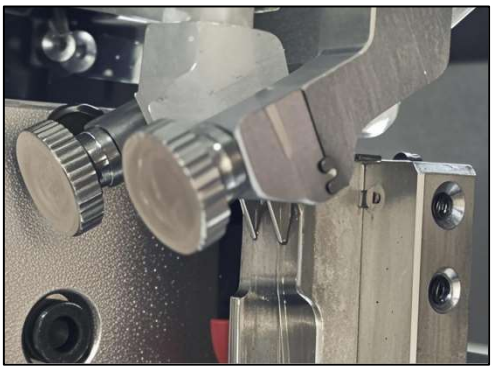
  It is inelastic. When matching with the PS carrier tape, it breaks open easily because of the aged PS. Therefore, it has to be used restrictedly with no shrinkage carrier tape like PC and so on.

- SMT 上有拋料、溢膠黏軌道、黏上帶收料機構之虞，導致客戶拒絕使用。

  Pop-off problem on SMT is always a concern. Excess adhesive left on SMTs feeder, cover tape rewinder, even customers refuse to use it.

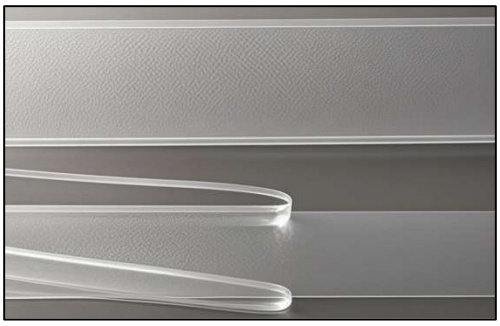


貳、 ncover 新發明說明



「ncover」是一款全新形態的透明上帶，其工藝是將未上膠薄膜與下帶(Carrier Tape)在封合前上水性壓敏膠（Aqueous PSA）[2]後封合，適用範圍廣、品質優良、即將取代現行上帶。

ncover is a brand-new type of transparent cover tape which features a revolutionary dispensing technique that applies Aqueous PSA to the glue-free film during the taping process to the carrier tape, and also is going to take place of all cover tapes.



SMT 上下帶剝離時是自易撕線斷裂。適用於 PS、PC、PET、紙帶等材質之下帶。有抗靜電、非抗靜電兩款。

A featured added easy tear line makes the tape peeling on SMT effortlessly. It can be matched with the carrier tapes in different materials such as PS, PC, PET and paper tape. ncover is available either in non-antistatic or antistatic.



- **拉力由材料「撕裂強度（tear strength）」決定，不受黏著力（Adhesion）影響，亦即拉力平穩且不隨老化而變化。**

The peel strength is decided by the tear strength of materials and will not be

[2]臺灣發明專利號“發明第 I556329 號”、大陸發明專利號“ZL201310098814.9”等。

affected by the adhesion. In other words, the peel strength is very smooth and not be changed by aging.

- 拉力跳動極小，優於現行任何上帶且不受下帶成型好壞影響。

  With minimal jump, the peel strength of ncover is better than any cover tape in the current market and is not affected by the forming results of the carrier tape.

- 耐衝擊強度（impact resistance）大，易撕線只能撕裂不會爆裂。

  With strong impact resistance, the easy tear line will not break open but can only be torn off.

- 黏膠層不易受環境改變而影響品質。

  The quality of the adhesive layer is very stable and will not be affected by the environmental changes.

- 無需加熱只需壓力即有封合效果，使用方便，可重複使用，重工亦方便。

  No heating but only pressure is applied to active the adhesive. ncover is user-friendly, reusable and also good for a rework.

- 封合層有彈性，搭配 PS 材質下帶時不會因 PS 老化收縮造成上下帶爆裂開。

  The adhesive layer has great flexibility. When matched with PS carrier tape, it will not break due to aged PS.

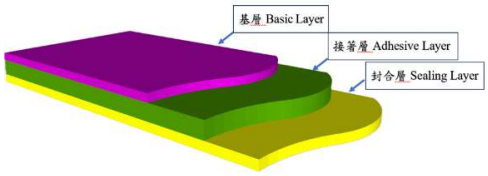
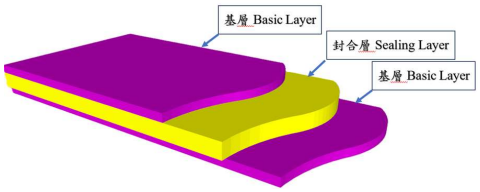
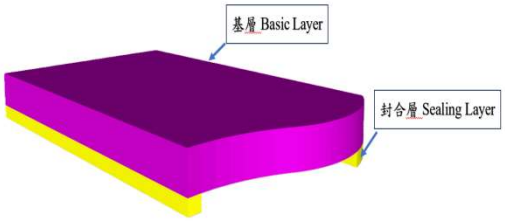
- 可藉增減膠量而獲得不同的黏著力。

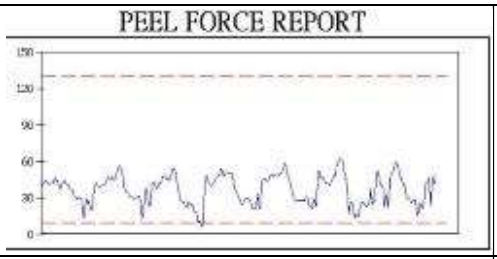
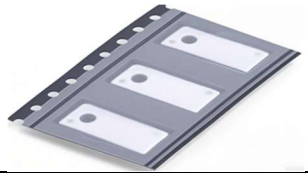
  Different adhesion can be obtained by adjusting the glue dispensing volume.

- SMT 上無撕裂、無拋料、無溢膠黏軌道、殘膠之虞。

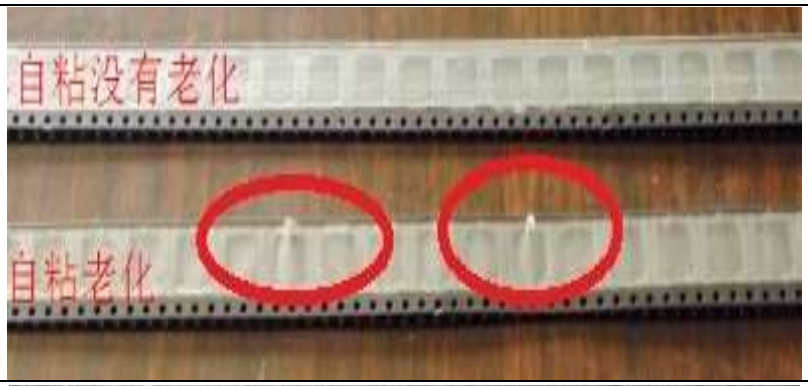
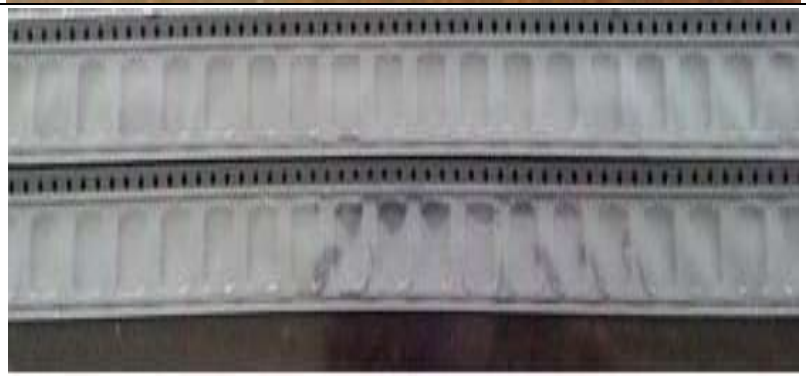
點出精緻，帶出精彩！

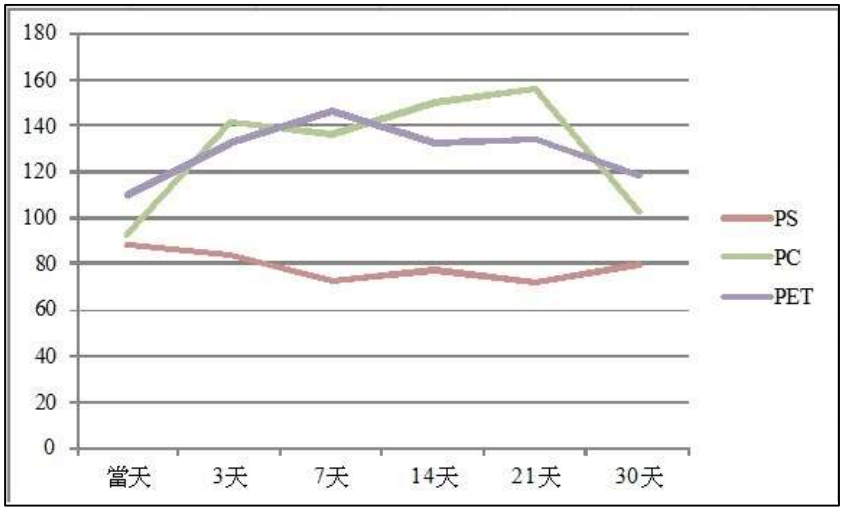
ncover keeps the SMT clean with no tearing, no pop-off, no residue and excess glue on track.

	Traditional cover tape	**ncover**
Structure	Complicated HAA  PSA  	**Simple** 
Coated Glue	○	×
Peel Method	Release 	**Tear** 
Quality	?	◎
Peel Strength	Jumping	**Smooth**

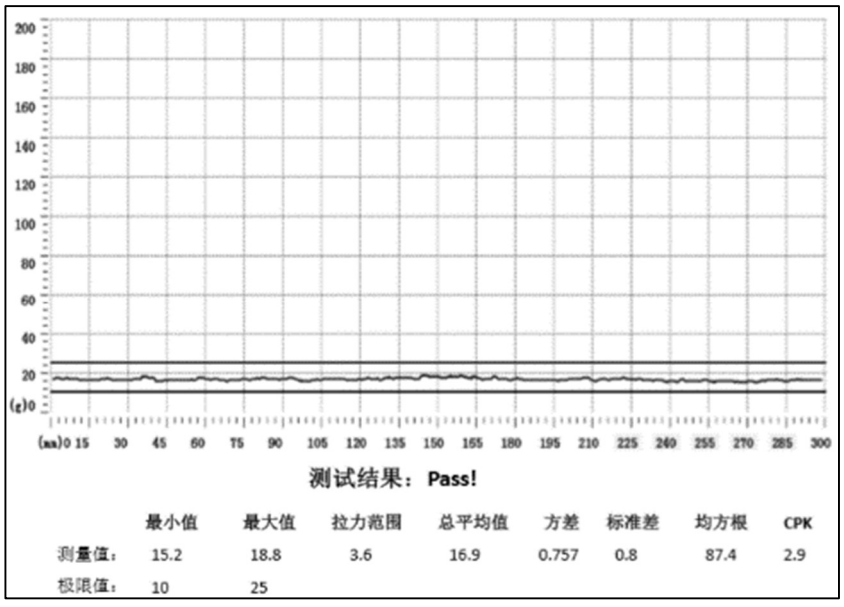
		
Cost	↑	↓
Haze	Fog, Opaque 	**Transparent** 

一、與不同材質下帶黏著力老化（52℃、95%RH）測試：Adhesion aging test

下帶 Carrier tape	變形 Deformed	
HAA	未爆裂 Not broken	
PSA	爆裂 Broken	
ncover	未爆裂 Not broken	



二、拉力老化測試：Peel strength aging test



參、 競爭優勢 Competition Advantages

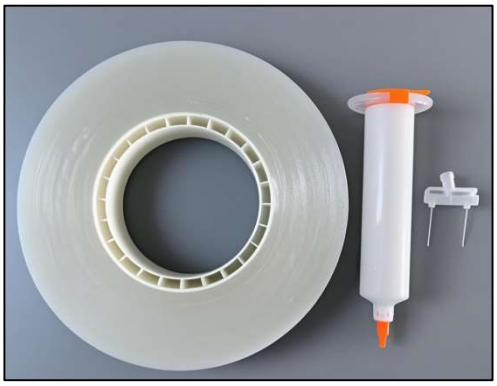
優　　勢
1、發明專利，原封合機無需變更。 2、成本低，節能。 3、每卷長度可達上千米，損耗低，實踐工業 4.0。 4、透明下帶材質可由 PS 改為 PET，成本可再降低。 5、較熱封型上帶使用方便。 6、易撕線拉力值跳動小，不受下帶成型影響。 7、透明度高，元件全檢方便。 8、 永久型抗靜電，表面阻抗值不受環境濕度影響，沒有封合層的變異數，比傳統上帶更穩定。 9、可在環境溫度 10~60℃作業，無濕度要求。 10、 無需更換下帶，重工方便。 11、 無搭配錯誤問題，適用各種下帶。 12、 停機時不溢膠、不堵針頭。 13、 無拉力老化問題，因採撕裂材料方式剝離。 14、 無溶劑環保問題，因水性不傷元件。 15、 無拋料（pop-off）問題。 16、 無溢膠問題。 17、 無撕裂問題。 18、 無儲存問題。

Advantages
1、 A Patented invention that does not require any changes of your existing taping machines.
2、 Low cost and energy saving.
3、 ncover can reach thousands of meters long, and the lost is low, practicing Industry 4.0.
4、 The cost can be cut down even more by choosing PET carrier tape instead of PS carrier tape.
5、 ncover is much easier to use than HAA.
6、 The easy tear line with low range of peel strength is not interfered by the forming results of the carrier tape.
7、 High transparency makes the component inspection easy.
8、 ncover a is a permanent antistatic cover tape, the surface resistant value is not affected by environmental humidity, there is no sealing layer variation, more stable than the traditional cover tape.
9、 ncover runs under environmental temperature 10~50 ℃ , no humidity requirements.
10、 Reworking is convenient because there is no need to replace the carrier tape.
11、 Free from matching errors because it is suitable for all kinds of carrier tape.
12、 No adhesive overflow, blocked needle problems when machine is stop.
13、 No aging problem because a newly tearing method is adopted during the peeling process.
14、 Free from the peel strength aging problem because the brilliant tearing method is adopted during the peeling process.
15、 No pop-off problem.
16、 No excess glue problem.
17、 No tearing problem.
18、 No storage problem.

肆、 工程測試 Engineering Test

一、 膠水：與國外專業大廠共同研發用於點膠工藝的耐高溫達 85℃、20 秒即可固化的環保水性壓敏膠。可存放於 5~40℃室內陰涼乾燥處，固化後耐 180℃。

Glue characteristics: 20 sec. solidified Eco-friendly aqueous PSA is developed by Joe with a global professional company. Temperature proof is up to 85℃, 180℃ after solidified. It can be stored at 5~40℃ place, .







- ncover 採用精度高達 0.01kg 的調壓閥控制膠水塗佈量，保持膠水連續性。

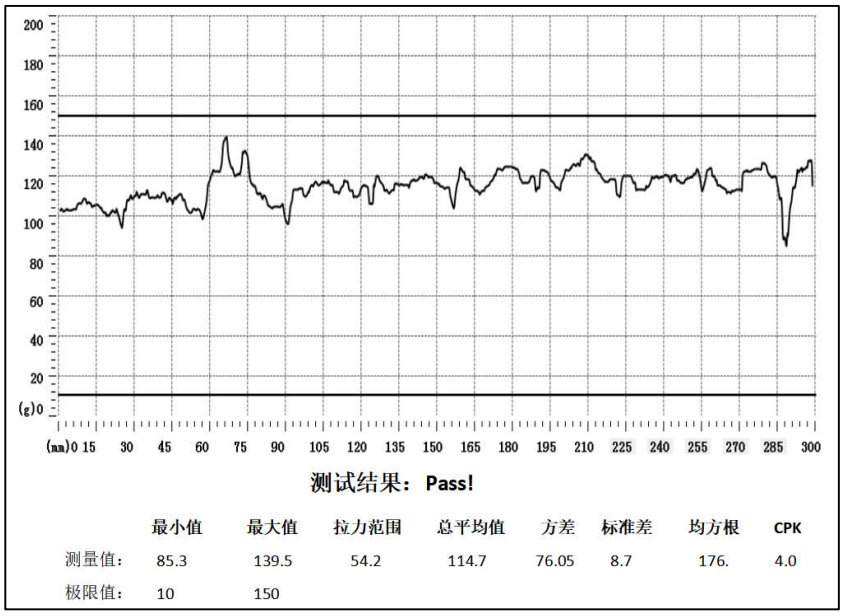


To maintain glue continuity, ncover uses an adjustable high precision valve with 0.01kg accuracy to control the amount of glue.

- 步進模式或停機再啟動的膠線交接處，所造成的積膠不影響黏著力。

The glue accumulation of line connection point caused by the step mode or stopped

and started again does not affect the adhesion.



● 膠水製程中會過濾雜質，分裝時再過濾一次，點膠過程中不因雜質阻塞針管。

To ensure the smooth glue flow during dispensing process, the impurities are filtered out twice during glue process and sorting.

二、 薄膜：物性資料 Film's Properties

1. ncover

物性	規格值	測試方法
密度 Density(g/cm^3)	0.9	ASTM D792
厚度 Thickness(μ)	50	Micro-gauge
抗張強度 Tensile strength(MPa)	40	ASTM D638
伸長率 Elongation(%)	500	ASTM D638
透明度 Gloss(%)	92	WI-21-321
霧度 Haze(%)	3.7	WI-21-321
表面阻抗值 Surface Resistance(Ω/cm^2)	Backing:1.0×10^{11} 以上 Adhesive:1.0×10^{11} 以上	ASTM D257

2. ncover a

物性	規格值	測試方法
密度 Density(g/cm^3)	0.9	ASTM D792
厚度 Thickness(μ)	50	Micro-gauge

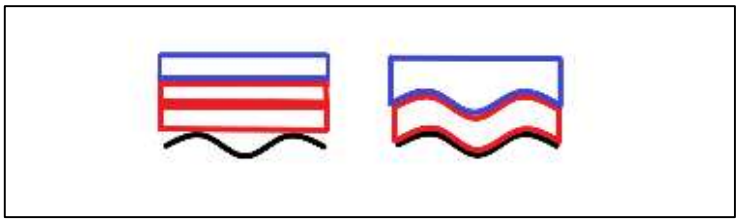
抗張強度 Tensile strength (MPa)	41	ASTM D638
伸長率 Elongation(%)	550	ASTM D638
透明度 Gloss(%)	91	WI-21-321
霧度 Haze(%)	7.1	WI-21-321
表面阻抗值 Surface Resistance(Ω/cm^2)	Backing:$1.0\times10^{6\sim11}$ Adhesive:$1.0\times10^{6\sim11}$	ASTM D257

- 運輸過程中易撕線不會爆裂，因為封合後捲帶層層相疊，元件衝擊上帶及上一層下帶底部，非僅上帶，所以上帶無需強大的耐衝擊強度。

  The reason for easy-tear line to stay intact during shipping process is the tape is stacked up in layers after sealing, the impact from components is not just on the cover tape but is also offset on the bottom of the carrier tape, so the cover tape can sustain and resist the impact.

- 膠線外觀不受下帶表面凹凸影響，黏著效果更好。

  The appearance of the glue line is not affected by the convex surface of the carrier tape, adhesion is better.



- 薄膜具伏貼性，封合後與成型槽間無間隙，輕薄元件不會翻轉、滑動到隔壁槽。

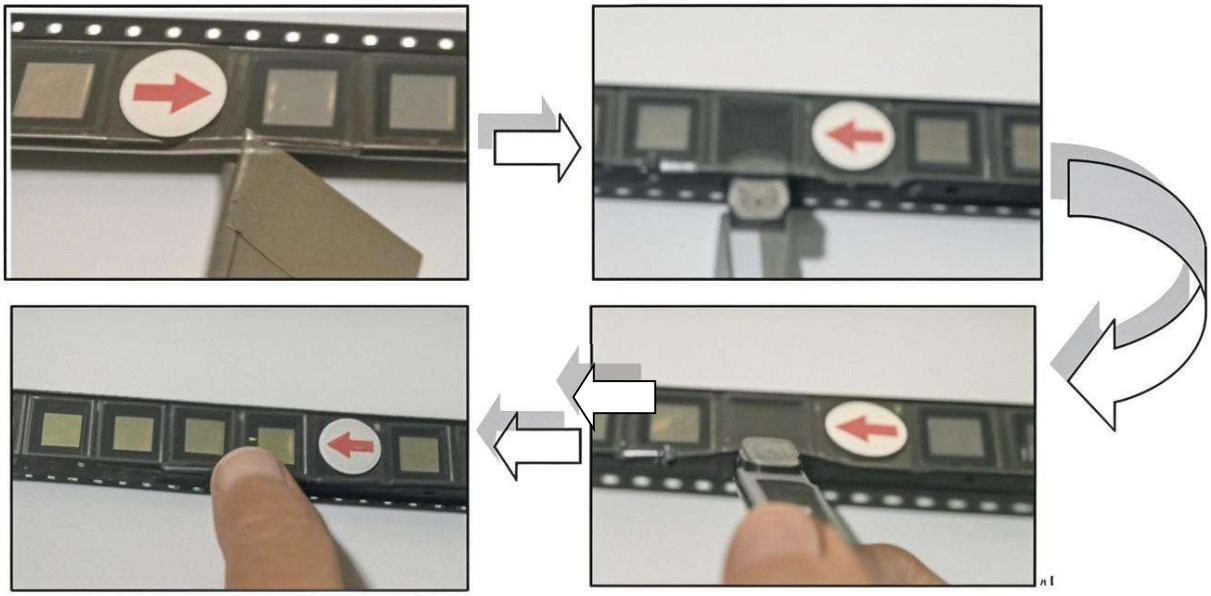
  There is no gap between the ncover and the cavity because ncover has a posted smoothly feature. The thin, light component will not flip and slide to the next cavity.

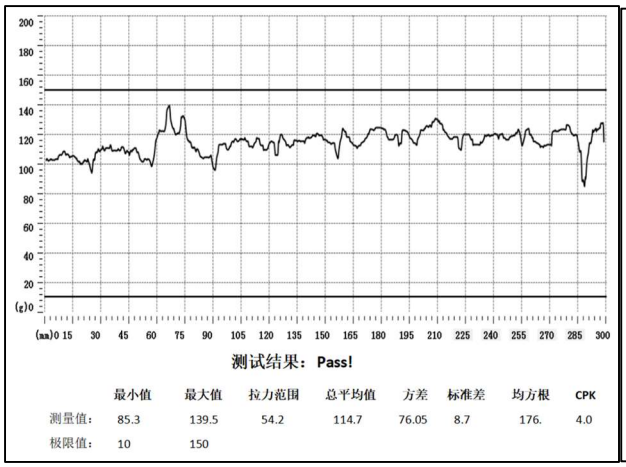


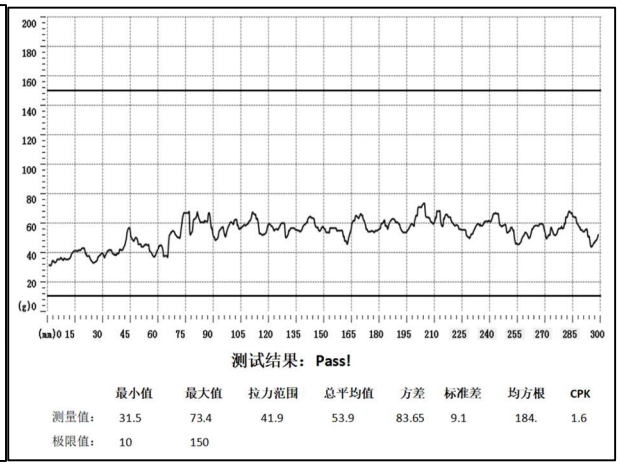


- 重工方便。

  Reworking is convenient.







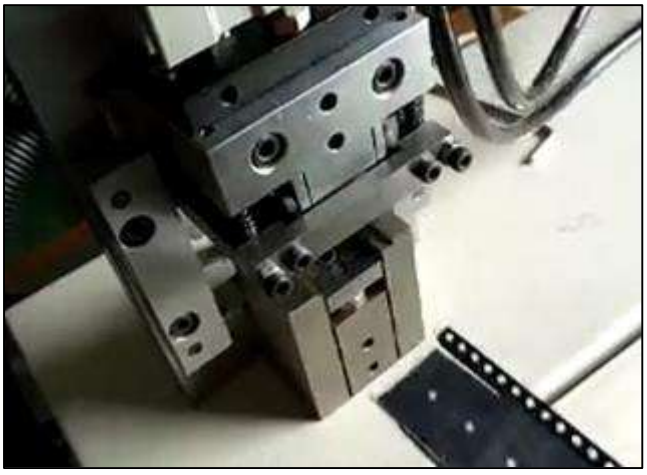
重工前 Before reworking　　重工後 After reworking

- 永久型抗靜電級上帶 ncover a，表面阻抗值不受環境濕度影響，沒有封合層的變異數，比傳統上帶更穩定。

  ncover a is a permanent antistatic cover tape, the surface resistant value is not affected by environmental humidity, there is no sealing layer variation, more stable than the traditional cover tape.

- 自動裁斷易撕線裝置，確保封合後每卷前端易撕線都已斷開一小段。

  To ensure that the front end of easy-tear line is easy to tear off with a short break, an automatic cutting device is recommended to purchase.



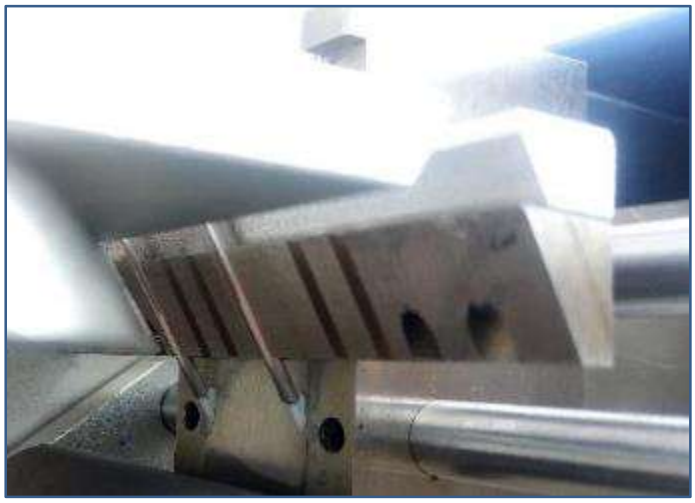
三、 針頭：不沾膠不鏽鋼管針頭，內徑 0.3mm，膠線寬度 0.7mm、厚度 0.015mm。

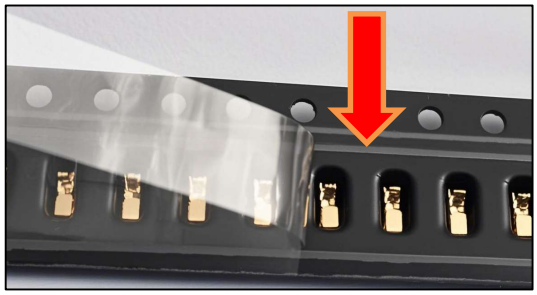
Needle: Stainless needle prevents from glue clogging, the inner diameter is 0.3mm, the width of the glue line is 0.7mm, and the thickness is 0.015mm.



四、 點膠定位：3D 固定式針頭定位平台，確保膠水不超出易撕線。

Position: 3D Fixed needle positioning platform makes sure that the glue does not extend beyond the easy-tear-line.





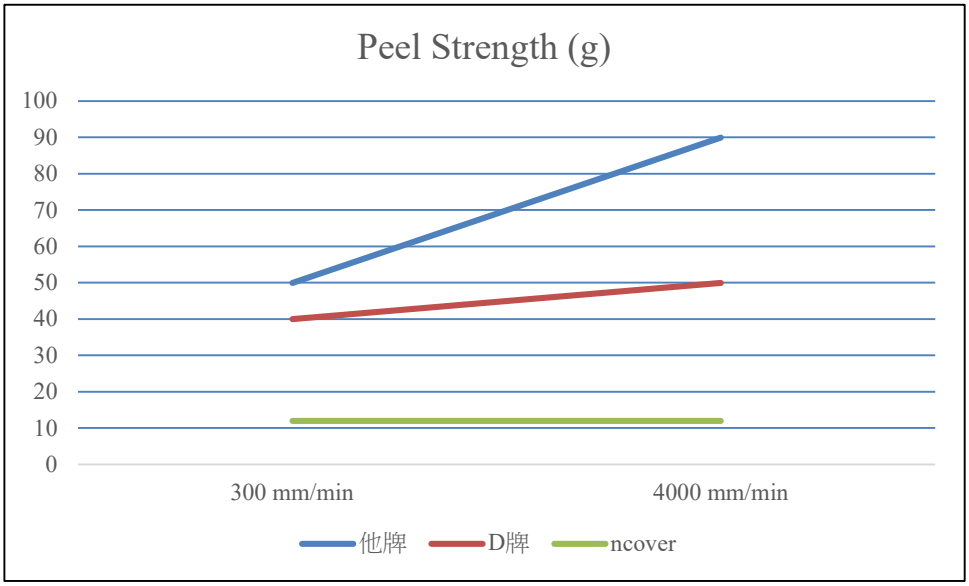
五、 拉力跳脫 EIA-481 規定且運用上更好：傳統上帶封合後拉力與黏著力是同一力，所以 EIA-481 僅需規範一個拉力。黏著力受上下帶材料介面特性、下帶成型表面平整度、膠水質量影響等。ncover 將拉力與黏著力分開，不受其他因素影響，能確保出廠到使用的拉力一致性。

Even though the peel strength of ncover does not meet the requirements of EIA-481, the application is better and more effective: The traditional cover tape has equal force on tension and adhesion after sealing, thus EIA-481 has to regulate the peel strength. Adhesion is influenced by the interface characteristics of cover and carrier tape materials, the roughness of molding surface of carrier tape, glue

quality and so on. ncover is able to separate tension and adhesion and to rule out all the influencing factors to ensure the consistency on rally value from the production of products to use.

SMT 上高速剝離不影響拉力。

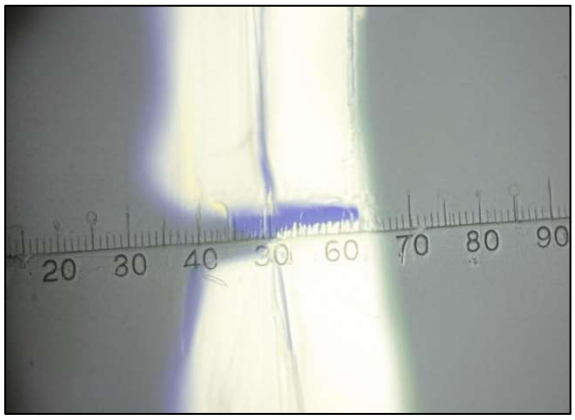
High-speed peeling does not affect the peel strength.



伍、 品保測試 Q.A. Test

一、薄膜：精密裁切機，易撕線未切深度 6~14μ。

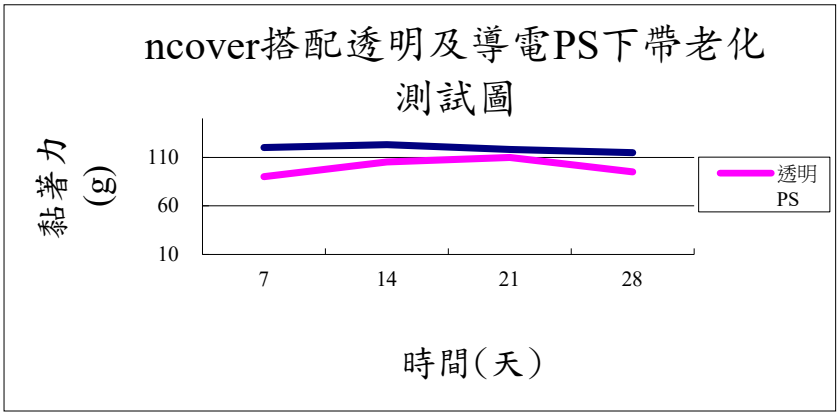
Film: Precision cutting keeps each easy tear line between 6~14μ uncut



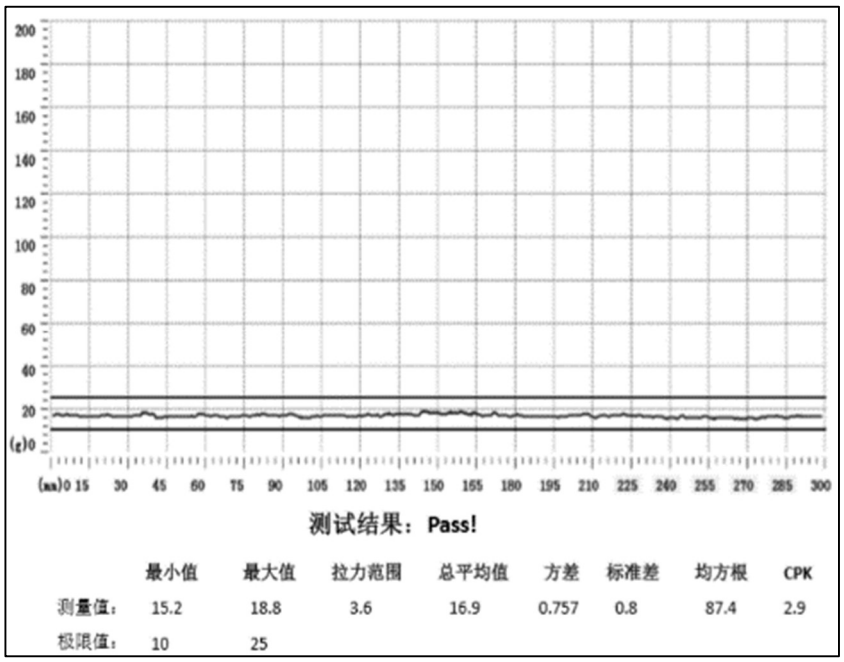
二、 薄膜及膠水 SGS 測試：SGS of Film and Glue

三、黏著力、拉力老化測試：Adhesion, Peel Strength Aging Test under 50℃,95％ RH

1、黏著力 Adhesion



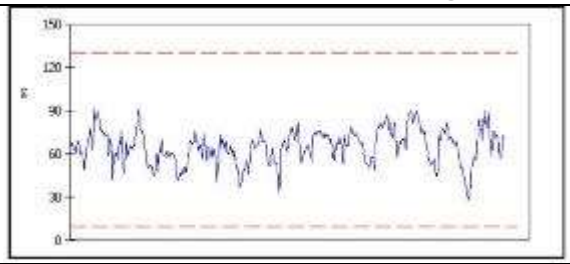
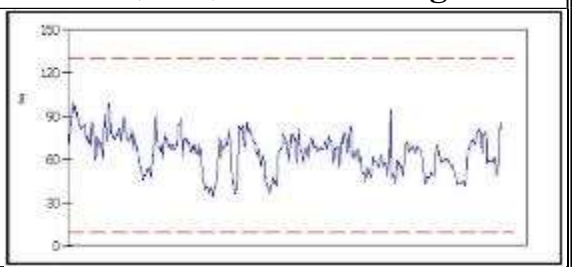
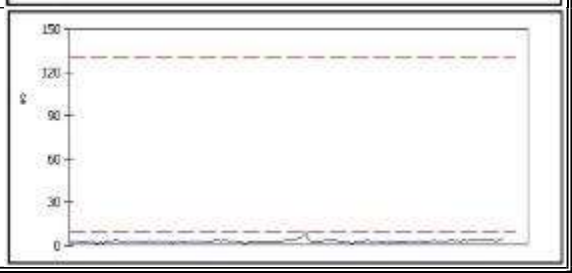
2、拉力 Peel Strength



四、落下測試 Drop Test

測試條件 Conditions	1、外圈纏繞一層保護帶。 Protective band is winded.  2、高度 1 米，整捲重量 3kg。 1M(H)x3Kg(W). 

測試前 Before Testing	
測試後 After Testing	封合線、易撕線皆無爆開。 Either seal lines or easy-tear lines stay intact. 

	測試前 Before Testing	測試後 After Testing
黏著力 Adh.		
拉力 Peel		

五、檢測儀器 Inspecting Instrument

膠水 Glue	
固型份測試儀 Solidify Tester	黏度測試儀 Viscosity Tester
	

薄膜 Film	針頭 Needle
金相顯微鏡 Metallurgical microscope	鐵氟龍斜切治具 Teflon cutting mold
	